

REMARKS

Claims 1-20 are pending in the application. No new matter has been presented.

Rejections under 35 USC §103(a)

Claims 1-3, 5-10, 12-14, and 16-20 were rejected under 35 U.S.C. 103(a) as being obvious over Levine (U.S. Patent No. 4,666,796) in view of Kim et al. (U.S. Publication No. 2003/0104651 A1) and Suzuki (Japanese Publication No. 2005-123297A).

Responding to Applicants' previous response, the Examiner alleged as follows:

With respect to arguments made in regards to claims 1-20, examiner respectfully disagrees. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). **Suzuki was not cited for the structure of the bonding layer, but rather for the utilization of a diffusion accelerator (Co) within the nickel layer of Levine.** The structure of the combination of Levine and Suzuki is constituted as Ni-Co/second layer/solder layer, as required by the limitations of claim 1. Furthermore, to implement the Sn solder layer of Kim on any structure as determined by the combination of Levine and Suzuki merely a common implementation in package construction in order to seal the structure (see Levine, Column 3, line 61 - Column 4, line 14 and Suzuki [0015]-[0016]; gold is used in both as a sealing layer, i.e., a functional equivalent of a solder). All intended use limitations of the above claims do not constitute procedural differences, but rather are merely reliant on the inherent properties of specific materials. By excluding diffusion barrier structures as the second layer, one of ordinary skill in the art could appreciate the utilization of any other material (gold in the current prior art would constitute a material that allows for diffusion of materials at higher temperatures in comparison to not allowing diffusion at lower temperatures.

(Office Action, page 15, item 6). However, Applicants are not trying to show nonobviousness by attacking references individually, but showing that there is no reason for a person having ordinary skill in the art to combine the teachings of Suzuki and Levine.

Despite above Examiner's allegation, Suzuki does not disclose the utilization of a diffusion accelerator (Co). Suzuki describes as follows:

[0034]

In the wiring board of this invention, the nickel-cobalt layer 10 is formed directly under the gold layer 11. Since **a cobalt component inhibits diffusion of nickel components**, part of nickel in the nickel layer 9 or the nickel-cobalt layer 10 is neither diffused into the inside of the gold layer 11, nor exposed to be oxidized on the surface of the gold layer 11. Thus, a nickel oxide or a nickel hydroxide having bad wettability with respect to the solder material 8 is hardly generated, whereby bonding the metallized layer 6 for sealing and the solder material 8 becomes strengthened, and bonding the metallized layer 6 for sealing and the metal lid body 2 through the solder material 8 reliably becomes further strengthened.

(Suzuki, paragraph [0034] (attached hereto)). Because of the difference in the function of the layers the order of the layers is also different. According to Suzuki, when the gold layer is the solder layer, the order of the layers is Ni/ Ni-Co/Au. In contrast, according to claim 1, when the diffusion accelerator is Co, the order of the layers is N-Co/Ni/solder layer. Thus, the order of the layers is different between Suzuki and the present invention. Therefore, even the teaching of Suzuki is combined with Levine, there is no reason that the hermetic sealing cap structure recited in claim 1 is obtained.

Claim 1 recites "a second layer formed to be in contact with the surface of said first layer." Because of this feature, the first layer can be easily diffused into the solder layer through the second layer when the solder layer bonds to the electronic component storing member at the second temperature higher than the first temperature as compared with a case where the second layer is not directly in contact with the surface of the first layer. This is not expected from Levine and Suzuki.

Also, Kim et al. simply describes Sn as an example of the materials to form a solder layer of a particular lid frame.

Therefore, even if Levine is combined with Suzuki and Kim et al., there is no reason to make a sealing cap comprising “a substrate; a first layer, formed on the surface of said substrate, mainly composed of Ni containing a diffusion accelerator; a second layer formed **to be in contact with** the surface of said first layer; and a solder layer mainly composed of Sn formed on a region of the surface of said second layer to which said electronic component storing member is bonded, wherein said second layer **is formed so as to inhibit** said first layer from diffusing into said solder layer at a first temperature **and diffuse** said first layer into said solder layer through said second layer when said solder layer bonds to said electronic component storing member at a second temperature higher than said first temperature.”

For at least these reasons, claim 1 patentably distinguishes over Levine, Suzuki and Kim et al. Claims 2, 3, and 5-9, depending from claim 1 patentably distinguish over Levine, Suzuki and Kim et al. for at least the same reasons.

For the substantially same reasons, independent claims 10 also patentably distinguish over Levine, Suzuki and Kim et al.

Similarly, regarding claim 12, none of Levin, Kim et al. and Suzuki discloses or suggests, among other things, “forming a solder layer mainly composed of Sn at a first temperature on a region of the surface of said second layer to which said electronic component storing member is bonded, with the second layer inhibiting said first layer from diffusing into said solder layer at the first temperature, wherein said second layer is formed such that said first layer diffuses into said solder layer through said second layer when said solder layer bonds to said electronic component storing member at a second temperature higher than said first temperature.” For at least these reasons, claim 12 patentably distinguishes over Levine, Suzuki and Kim et al.

Claims 13, 14 and 16-20, directly or indirectly depending from claim 12, also patentably distinguish over Levine, Suzuki and Kim et al. for at least the same reasons.

Claims 4 and 15 were rejected under 35 U.S.C. 103(a) as being obvious over Levine (U.S. Patent No. 4,666,796) in view of Kim et al. (U.S. Publication No. 2003/0104651 A1) and Suzuki (Japanese Publication No. 2005-123297 as applied to claims 1-3 and 12-14 above, and further in view of Woolhouse et al. (U.S. Patent No. 4,236,296; hereinafter referred to as Woolhouse).

Claim 4, depending from claim 1, and claim 15, indirectly depending from claim 12, patentably distinguish over Levine, Suzuki and Kim et al. for at least the same reasons as discussed above.

Woolhouse et al. has been cited for allegedly disclosing second layer has a thickness of at least 0.03 pm and not more than 0.075 pm. However, such a disclosure of Woolhouse et al. does not remedy the deficiencies of Levine, Suzuki and Kim et al.

For the substantially same reasons, claims 4 and 15 patentably distinguish over Levine, Suzuki, Kim et al. and Woolhouse et al.

Claim 11 was rejected under 35 U.S.C. 103(a) as being obvious over Levine (U.S. Patent No. 4,666,796) in view of Kim et al. (U.S. Publication No. 2003/0104651 A1) and Suzuki (Japanese Publication No. 2005-123297 A) as applied to claim 10 above, and further in view of Shiomi et al. (U.S. Publication No. 2004/0023487 A1; hereinafter referred to as Shiomi).

Claim 11, depending from claim 10, patentably distinguishes over Levine, Suzuki and Kim et al. for at least the same reasons as discussed above.

Shiomi et al. has been cited for allegedly disclosing the junction between said hermetic sealing cap and said electronic component storing member contains an intermetallic compound consisting of an Ni-Sn alloy. However, such disclosures of Shiomi et al. do not remedy the deficiencies of Levine, Suzuki and Kim et al.

For the substantially same reasons, claim 11 patentably distinguish over Levine, Suzuki, Kim et al. and Shiomi et al.

In view of the aforementioned remarks, Applicants submit that the claims are in condition for allowance. Applicants request such action at an early date.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney to arrange for an interview to expedite the disposition of this case.

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

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Enclosure: Partial English Translation of JP 2005-123297

English Translation of Paragraph [0034] of JP2005-123297

Japanese Patent Office
Patent Laying-Open Gazette

Patent Laying-Open No. 2005-123297
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International Class(es): H01L 23/02

Title of the Invention Package for Housing
Electronic Part
Patent Appln. No. 2003-354789
Filing Date: October 15, 2003
Inventor(s): Maki Suzuki
Applicant(s): Kyocera Corp.

(transliterated, therefore the
spelling might be incorrect)

[0034]

In the wiring board of this invention, the nickel-cobalt layer 10 is formed directly under the gold layer 11. Since a cobalt component inhibits diffusion of nickel components, part of nickel in the nickel layer 9 or the nickel-cobalt layer 10 is neither diffused into the inside of the gold layer 11, nor exposed to be oxidized on the surface of the gold layer 11. Thus, a nickel oxide or a nickel hydroxide having bad wettability with respect to the solder material 8 is hardly generated, whereby bonding the metallized layer 6 for sealing and the solder material 8 becomes strengthened, and bonding the metallized layer 6 for sealing and the metal lid body 2 through the solder material 8 reliably becomes further strengthened.